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September 12, 2016

Marlene S. Dortch  
Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street SW  
Washington, D.C. 20554

Re: ***Ex Parte Statement***  
**ET Docket No. 13-49**

Dear Ms. Dortch:

This letter is submitted in response to the Wireless Internet Service Providers Association (“WISPA”) filing of August 24, 2016. That filing is in furtherance of an effort to secure relaxation of the OOBE limits applicable to the band 5150-5250 MHz. The filing argues that the Aerospace and Flight Test Radio Coordinating Council, Inc. (“AFTRCC”) letter of July 11, 2016, is defective procedurally and substantively. As a procedural matter, it asserts that that letter should be dismissed as untimely. Substantively, it argues that a combination of geographic protection zones as prescribed at 3.5 GHz to protect government radar and other facilities, and professional installation of the wireless broadband facilities, would adequately protect flight test telemetry receive stations operating below 5150 MHz. For the reasons set forth below, there is no merit to these arguments.

At the outset, WISPA should not be taking AFTRCC to task on grounds of timeliness: Its own Petition is tardy, not to say redundant.

While the Petitioner asks for reconsideration of the Commission’s OOBE ruling in the *Memorandum Opinion and Order*, the *Notice of Proposed Rulemaking*, FCC 13-22, 28 FCC Rcd 1749 (2013) (the “Notice”), sought comment on the very same issue. *Id.* at para. 38, 40 (seeking comment on limiting OOBE for the U-NII-1 band). However, WISPA’s comments in the rulemaking said nothing about the proposed relaxation it now seeks for 5150-5250 MHz OOBE; it merely said, without further specification, that “the Commission can adopt appropriate out-of-band emission limits for both U-NII-1 devices and any operations that may be authorized in the

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Marlene S. Dortch  
September 12, 2016  
Page 2

pending proceeding to protect the 5091-5150 MHz band for Aeronautical Mobile Telemetry from adjacent-channel interference.”<sup>1</sup>

And this is just what the Commission did. In the *First Report and Order*, the Commission held:

We adopt our proposal to apply the more restrictive unwanted emissions limits in Section 15.407 for the combined new rule, rather than the more lenient unwanted emissions limit currently in Section 15.247. This decision is consistent with our decision to apply the 15.407 out-of-band emission levels in the U-NII-2 bands and having a single limit for devices that operate in any U-NII band will provide clarity and simplicity, while providing appropriate protection to incumbent services. As noted above, the record shows broad support for adopting the tighter unwanted-emissions limits of Section 15.407 limits.

29 FCC Rcd 4127 (2014) at para. 119 (*First Report and Order*)(footnote omitted).<sup>2</sup>

Thereafter, on June 2, 2014 WISPA filed a Petition for Partial Reconsideration of the *First Report and Order*. However, that Petition was expressly limited to tighter emission limits for the 5725-5850 MHz band. The Petition said nothing contrary to the application of Rule 15.407 OOB limits to 5150-5250 MHz. *Id.* at 5. Thereafter, in the *Memorandum Opinion and Order*, the Commission declined to increase the allowable emissions from U-NII band devices into the restricted band below 5.15 GHz.

While WISPA itself did not raise the 5150-5250 MHz issue on reconsideration, other allied parties did. It appears that WISPA did not offer a specific OOB proposal for the band until March 23, 2015, long after the date for seeking reconsideration, when it joined an ex parte filing by a number of other parties. Thus, when the Commission addressed the 5150-5250 MHz OOB issue in the *Memorandum Opinion and Order*, it characterized the multiple U-NII filings in shorthand form as “[t]he proposal filed by WISPA et al. on March 23, 2015 . . . .” *Id.* at para. 33.<sup>3</sup>

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<sup>1</sup> Comments filed May 28, 2013, page 11. The Comments attached a table for the various U-NII bands, a portion of which dealt with sharing; this portion merely contained a reference “OOB.”

<sup>2</sup> It is this decision which the Commission affirmed in the *Memorandum Opinion and Order* at issue. FCC 16-24, 31 FCC Rcd 2317 (2016).

<sup>3</sup> The *Memorandum Opinion and Order* recognized the fact that WISPA “asked the Commission to reconsider the more restrictive out-of-band emissions (OOB) limit for the U-NII-3 [5725-5850 MHz] band adopted in the *First R&O*,” while “Mimosa and Cambium requested that the OOB limits be modified for the U-NII-1 band [5150-5250 MHz] as well.” *Id.* at para. 4. See also *id.* at para. 5 (“Subsequent to the filing deadlines for petitions for reconsideration, multiple ex parte presentations have been submitted by various parties or groups of parties

Marlene S. Dortch  
September 12, 2016  
Page 3

In other words, WISPA failed to offer its instant proposal not just once (in response to the *Notice*), but a second time (in its June 2014 Petition for Partial Reconsideration), while simultaneously choosing to seek reconsideration on other issues that apparently it considered more important.

The Commission's Rules are clear: A petitioner must not seek to present by way of reconsideration material that it should have presented pre-decision. Rule 1.429(b)(2); *cf.* Rule 1.106(c). Reconsideration is appropriate only where a petitioner can show either a material error or omission in the original order, or raises new facts not known or not existing until after the petitioner's last opportunity to present such matters. Put another way, reconsideration "will not be granted merely for the purpose of again debating matters on which the tribunal has once deliberated and spoken." See *WWIZ, Inc.*, 37 FCC 685, 686 (1964), *aff'd sub nom., Lorain Journal Co. v. FCC*, 351 F.2d 824 (D.C. Cir. 1965), cert. denied, 383 U.S. 967 (1966). As the D.C. Circuit has said:

We cannot allow [an] applicant to sit back and hope that a decision will be in its favor and, when it isn't, to parry with an offer of more evidence. No judging process in any branch of government could operate efficiently or accurately if such a procedure were allowed.

*Colorado Radio Corp. v. FCC*, 118 F.2d 24, 26 (D.C. Cir. 1941). Here, WISPA apparently hoped that the Commission in the *First Report and Order* and, then, again in the *Memorandum Opinion and Order* would rule its way. Only when the Commission twice did not so rule did WISPA itself file a petition for reconsideration focused on the 5150-5250 MHz OOB issue.

But this is not all. The Petition is also redundant: It adds nothing new to the record; on the contrary, it simply incorporates arguments made either on prior reconsideration or in various subsequent *ex partes*.<sup>4</sup> Thus, the Petition contravenes Rule 1.429(l)(3) and (8); *i.e.* it relies on arguments which already have been fully considered and rejected by the Commission, and relates to an order for which reconsideration has been denied on similar grounds.

The Commission's rules expressly allow for the filing of *ex parte* statements at any time before the Sunshine period during the course of an informal rulemaking like this. This

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proposing alternatives to the current OOB requirements. Two hundred and twelve parties filed comments in response to the petitions . . .").

<sup>4</sup> Such as the multi-party *ex parte* of March 23, 2015 which WISPA joined. AFTRCC addressed these arguments in its July 11 submission. Note that none of the parties which raised the issue in earlier petitions for reconsideration, have sought reconsideration of the issue here.



opportunity is underscored here by the fact that there has been no claim -- much less showing -- that the Petitioner was somehow prejudiced by AFTRCC's presentation.

In short, WISPA is in no position to criticize AFTRCC for purported procedural deficiencies, having itself relied on an ex parte (March 23, 2015) submitted well after the date for reconsideration, and filings by other parties to carry its proposal for it.

On the merits, the Petitioner's August 24 filing fares no better. It argues that a combination of protection zones and professional installation is sufficient to protect flight test telemetry receive sites, analogizing its proposal to the rules adopted for 3550-3650 MHz to protect incumbent radar and other operations.

There is no merit to this position. For openers, the regime at 3.5 GHz relies crucially on a spectrum access system ("SAS"), of which professional installation is an integral part, to enforce interference protection for incumbent systems. This is a dynamic database being established in the 3.5 GHz band capable of protecting Government radar facilities, for example, on a real-time basis. There is nothing remotely likely this applicable at 5150-5250 MHz.

Second, the Commission has spent years struggling with interference caused by 5 GHz wireless internet providers to terminal doppler weather radar ("TDWR") systems important for flight operations. This, despite tomes of assurances from unlicensed proponents that sensitive TDWR facilities would be fully protected. Those promises far too often were not kept, and the agency has spent years trying to fix the problem caused by unlawful U-NII operation.<sup>5</sup> Under the circumstances, it would be reckless to rely on similar such assurances now.

Third, the technical statement adds nothing of substance. In fact, it reflects material omissions and misunderstandings. As described in the attached Engineering Statement, it incorrectly assumes that AMT antennas seldom operate at low elevation angles; incorrectly suggests that AMT antennas do not need 360-degree azimuth protection; and, in particular, greatly underestimates the distance required to protect AMT facilities.

Perhaps most fundamentally, though, the Petition and its technical statement betray a fundamental lack of knowledge regarding flight test operations, and the consequences of interference to same. As the Commission is well aware, flight testing involves very high value operations. Depending on the program, the cost of any given flight test can range into hundreds of thousands of dollars, and sometimes in excess of seven figures. Interference causes data drop-outs in the telemetry stream which, in turn, require the pilot to repeat affected maneuvers, or re-

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<sup>5</sup> FCC Enforcement Advisory: Enforcement Bureau Takes Action to Prevent Interference to FAA-Operated Terminal Doppler Weather Radars Critical to Flight Safety, DA 12-459, September 27, 2012 (attachment). For a list of numerous enforcement actions against wireless internet service operators, see <https://www.fcc.gov/general/u-nii-and-tdwr-interference-enforcement>.



Marlene S. Dortch  
September 12, 2016  
Page 5

fly the entire mission, in order to capture clean, uncorrupted data. These data are essential to certification of aircraft, whether for airworthiness or mission performance. Of course, in the case of missiles, there can be no re-flights: The only data that can be collected, must be collected during a one-way trip. If a re-test is required, a new missile must be used.

In summary, the Commission should entertain AFTRCC's presentations and conclude that there is no merit to the Petition. Rather, the Commission should adhere to its twice-stated position not to relax the OOB level applicable at 5150-5250 MHz.

Respectfully submitted,



William K. Keane  
*Its Counsel*

cc: Julius Knapp  
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WKK/sd



# PUBLIC NOTICE

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DA 12-459  
September 27, 2012  
Enforcement Advisory No. 2012-07

## FCC ENFORCEMENT ADVISORY

### TDWR and U-NII DEVICES

#### Enforcement Bureau Takes Action to Prevent Interference to FAA-Operated Terminal Doppler Weather Radars Critical to Flight Safety

The Enforcement Bureau recently took action against several companies for operating devices that caused interference to Terminal Doppler Weather Radars (TDWRs) maintained by the Federal Aviation Administration (FAA).<sup>1</sup> TDWR systems operating in the 5600-5650 MHz band are used by the FAA to obtain quantitative measurements for gust fronts, wind shear, microbursts, and similar information.

Investigations conducted by the FCC, the FAA, and the National Telecommunications and Information Administration (NTIA) in several areas of the United States and Puerto Rico revealed that much of the interference stems from wireless devices sharing the same band as TDWR systems, and operating outdoors in the vicinity of airports at high elevations that are line-of-sight to the TDWR installations and most are operating inconsistent with the FCC Part 15 Rules.<sup>2</sup> The Enforcement Bureau and the FAA continue to investigate additional areas where interference is reported to TDWR systems, and will continue to take appropriate enforcement action as necessary.

#### What do the rules require?

*Manufacturers, marketers, and users of U-NII devices are hereby cautioned that only devices certified under FCC Part 15, Subpart E of the Rules may be operated as U-NII devices. For those U-NII devices operating as a master device in the 5.25 GHz – 5.35 GHz and 5.47 GHz – 5.725 GHz bands, a Dynamic Frequency Selection (DFS) radar detection mechanism must be enabled.<sup>3</sup> A piece of equipment is no longer certified as required under the FCC rules if it is installed or configured to defeat DFS, to utilize*

<sup>1</sup> *VPNet, Inc.*, Notice of Apparent Liability for Forfeiture and Order, 27 FCC Rcd 2879 (Enf. Bur. 2012); *Argos Net, Inc.*, Notice of Apparent Liability for Forfeiture and Order, 27 FCC Rcd 2786 (Enf. Bur. 2012); *Insight Consulting Group of Kansas City, LLC*, Notice of Apparent Liability for Forfeiture and Order, 26 FCC Rcd 10699 (Enf. Bur. 2011); *Ayustar Corp.*, Notice of Apparent Liability for Forfeiture and Order, 26 FCC Rcd 10693 (Enf. Bur. 2011); *Rapidwave, LLC*, Notice of Apparent Liability for Forfeiture and Order, 26 FCC Rcd 10678 (Enf. Bur. 2011); *AT&T, Inc.*, Notice of Apparent Liability for Forfeiture, 26 FCC Rcd 1894 (Enf. Bur. 2011); *Utah Broadband*, Notice of Apparent Liability for Forfeiture, 26 FCC Rcd 1419 (Enf. Bur. 2011) (forfeiture paid). See also *Ayustar Corp.*, Memorandum Opinion and Order, 25 FCC Rcd 16,249 (Enf. Bur. 2010); *Sling Broadband, LLC*, Forfeiture Order, 26 FCC Rcd 13062 (Enf. Bur. 2011).

<sup>2</sup> 47 C.F.R. §§ 15.1 et seq.

<sup>3</sup> See 47 C.F.R. §§ 15.401 – 15.407. See also Memorandum from Julius Knapp, Chief, Office of Engineering and Technology, FCC, and P. Michele Ellison, Chief, Enforcement Bureau, FCC, to Manufacturers and Operators of Unlicensed 5 GHz Outdoor Network Equipment Re: Elimination of Interference to Terminal Doppler Weather Radar (TDWR) (dated July 27, 2010), available at <http://www.fcc.gov/encyclopedia/weather-radar-interference-enforcement>.

antennas other than those certified for the device, or to make other changes that modify the equipment beyond the configuration that has been certified. Using uncertified U-NII devices, or certified U-NII devices in an unauthorized manner, violates the FCC Part 15 Rules and may result in interference to radio communications services critical to public safety.

*Users are also cautioned that operation of the U-NII device must not cause harmful interference, and if harmful interference occurs, the operation must cease immediately.*<sup>4</sup> Furthermore, federal law prohibits willful or malicious interference to authorized radio communications.<sup>5</sup>

### **What Should U-NII Operators Do to Comply?**

Users of U-NII devices must ensure certified devices are installed and configured properly. Additionally, if the U-NII devices are installed and operating within 35 km of a TDWR system, users are required to take special precautions on the frequency of operation as described in the OET Guidance 443999.<sup>6</sup> We caution users of U-NII devices, however, that a U-NII device must not cause interference to a TDWR system, regardless of the distance between the U-NII device and the TDWR.

In fact, operators of U-NII devices under FCC Part 15 Rules must not only refrain from causing interference but also must accept interference from licensed devices such as the TDWR systems. Any user causing interference may be required to cease operating the U-NII device, even if the device in use was properly certified and configured, and will not be permitted to resume operation until the condition causing the interference has been corrected.<sup>7</sup> Even if they avoid or fix any interference problems, however, U-NII operators may only operate those devices within authorized frequencies, power limitations, and other technical requirements.

Finally, the FCC encourages users of U-NII devices near the TDWR systems to register in the voluntary database system discussed in the Guidance.

### **What Should Manufacturers and Retailers Do to Comply?**

As noted above, manufacturers must ensure that U-NII devices capable of operating in certain bands have a DFS radar detection mechanism and must not have software configurations that allow users to disable the features.<sup>8</sup> We also require manufacturers of U-NII devices to remind their customers to ensure that the U-NII devices are properly configured and used in an authorized manner and that they do not cause interference to TDWRs as described in the various guidance documents. Moreover, retailers must ensure that the equipment they are marketing complies with FCC rules. We will continue to work with manufacturers and retailers to adopt tools to better educate their customers and other parties about the rules governing U-NII devices.

### **What Are the Penalties that Apply?**

Violations of the FCC Part 15 Rules may subject the responsible party to enforcement action, including substantial monetary forfeitures, seizure of the equipment, and criminal sanctions, including imprisonment. Therefore, this advisory emphasizes the importance of complying strictly with these important legal requirements.

### **Need more information?**

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<sup>4</sup> See 47 C.F.R. § 15.5. Harmful interference is defined as “[a]ny emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communications service.” 47 C.F.R. § 15.3(m).

<sup>5</sup> See 47 U.S.C. § 333.

<sup>6</sup> See OET KDB Publication 443999 available at <http://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=41732&switch=P> (OET Guidance).

<sup>7</sup> See 47 C.F.R. § 15.5.

<sup>8</sup> See OET Guidance, *supra* note 6.



To file a complaint regarding noncompliant U-NII devices, visit <http://esupport.fcc.gov/complaints.htm>. For additional information regarding compliance with and enforcement of the rules governing U-NII devices and TDWR systems interference, please contact the Enforcement Bureau at (202) 418-7450. For general information on U-NII devices and TDWR systems, please visit <http://www.fcc.gov/encyclopedia/weather-radar-interference-enforcement> or e-mail [TDWRIX@fcc.gov](mailto:TDWRIX@fcc.gov).

To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to [fcc504@fcc.gov](mailto:fcc504@fcc.gov) or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), (202) 418-0432 (TTY). You may also contact the Enforcement Bureau on its TTY line at (202) 418-1148 for further information about this Enforcement Advisory, or the FCC on its TTY line at 1-888-Tell-FCC (1-888-835-5322) for further information about the rules governing U-NII devices.

Media inquiries should be directed to William Davenport, [William.Davenport@fcc.gov](mailto:William.Davenport@fcc.gov), (202) 418-1034.

Issued by: Chief, Enforcement Bureau

-FCC-

## Engineering Statement

This Engineering Statement is in response to the Wireless Internet Service Providers Association ("WISPA") letter dated August 24, 2016, and the Technical Statement included with that letter.

In these documents, WISPA makes several inaccurate assertions and conjectures regarding the technical and operational characteristics of Aeronautical Mobile Telemetry ("AMT").

The Petition supplies a Technical Statement which takes the position that AMT protection is required in only a small portion of the United States; that AMT facilities operate with elevation-plane antenna directionality; and that a 7 km restricted radius around each telemetry receiving station would be a more efficient and appropriate sharing solution than outright prohibiting the relaxed OOB limits proposed in the WISPA Petition. The Statement concludes that: "Raising the allowable OOB by 20 dB would increase the free-space range tenfold, to 70 km. Taking into account the curvature of the Earth, if not terrain and clutter, and the fact that the telemetry antenna is usually not pointing at the horizon and may not require full-circle protection, the actual potential interference areas would be reduced even further for U-NII-1 devices not mounted very high above average terrain." Statement at page 3.

There are several problems with these statements:

- Elevation-plane antenna directionality is immaterial as an interference mitigation factor. Telemetry antennas typically point at the horizon and require full-circle protection.
- A 7 km restricted radius around a telemetry receiving station becomes 50 km when the allowable OOB is raised by 20 dB and the proper AMT protection criteria are used.<sup>1</sup>
- For a protection radius of 5.6 km, increasing the allowable OOB by 20 dB increases the free-space U-NII-1 transmission range ten-fold, to 56 km. However, taking into account the curvature of the earth, achieving line of sight visibility over a distance of 56 km requires that the WISPA transmit and receive antennas each be 46 meters high. It is thus hardly the case that U-NII-1 devices will be "not mounted very high above average terrain." (Statement at page 3)

These and other points are addressed in detail below.

1. "Flight test telemetry receive antennas are highly directive and point

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<sup>1</sup> AMT protection criteria are specified in ITU-R Recommendation M.1459. Those criteria are actually less restrictive than the presumed criteria used by WISPA; i.e. 7 km becomes 5.6 km.

at the airplane, which presumably is located above the horizon, so the antenna gain towards a UNII -1 antenna near the ground, or at a device located at distance where the curvature of the Earth impedes the path, should be considerably lower than its rated peak gain. There are a small number of AFTRCC facilities, all of which operate with elevation-plane antenna directionality.” (Statement at page 1)

Due to the curvature of the earth, and the fact that most test flights are carried out significantly below maximum altitude, the majority of such operations occur at low antenna elevation angles of 1 degree or less. Thus, for interference to AMT from terrestrial sources, “elevation-plane antenna directionality” is essentially irrelevant as an interference mitigation factor.<sup>2</sup>

Moreover, due to weather, air traffic restrictions imposed by the FAA and other operational factors, AMT operations are protected for a full 360 degree azimuth around the antenna in order to maximize operational flexibility. The Statement’s assumptions to the contrary are not correct.

2. “...a 7 kilometer restricted radius around each telemetry receiving station would be a far more efficient and appropriate sharing solution than outright prohibiting the relaxed OOB limits proposed in the WISPA Petition.” (Statement at pages 2-3)

Using a *pf*<sub>d</sub> protection value of  $-181 \text{ dBW/m}^2$  in 4 kHz, per Rec. M.1459, and assuming free-space propagation (i.e. the *inverse-r*<sup>2</sup> law given by the equation  $pf_d = EIRP/(4\pi r^2)$ ) normalized to the proper reference bandwidth and the most restrictive effective isotropic radiated power OOB value of  $-41 \text{ dBm/MHz}$ , yields a protection radius value of 5.6 km.

3. “Raising the allowable OOB by 20 dB would increase the free-space range tenfold, to 70 km.” (Statement at page 3)

Raising the average OOB by 20 dB to  $-21 \text{ dBm/MHz}$  increases the distance tenfold, as noted in the WISPA engineering statement; however, the correct distance is 56 km (versus the 70 km referenced in the filing). It is this larger value of 56 km, not the lower values of 5.6 km and 28.3 km, that specifies the actual protection radius as shown below.

4. “Taking into account the curvature of the Earth, if not terrain and clutter, and the fact that the telemetry antenna is usually not pointing at the horizon and may not require full-circle protection, the actual potential interference areas would be reduced even further for U-NII-1 devices not mounted very high above average terrain.” (Statement at page 3)

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<sup>2</sup> As defined in Recommendation M.1459, and validated by examination of actual flight test activities, each flight test ground station defines an operational area of approximately 320 km in radius. The required protection against interfering emitters located within line of sight of flight test ground stations requires coordination for approximately 40% of CONUS, contrary to the assumption that protection is required “in only a small portion of the United States.” (Statement at page 1)



Determination of the line of sight distance between two radio towers across a spherical earth, including the effects of “4/3” atmospheric refraction, is given by the equation

$$d = \sqrt{2r_e h_1 \times 4/3} + \sqrt{2r_e h_2 \times 4/3}$$

where  $d$  is the line of sight distance between towers of heights  $h_1$  and  $h_2$  and  $r_e = 6358 \text{ km}$  is the radius of the earth.

For two WISPA backhaul towers separated by *56 km*, the towers supporting the backhaul antennas must each be *46 meters* tall. This is higher than most LTE cell towers<sup>3</sup> and is not, by any measure, “near the ground” as referenced in paragraph three of the Statement. Indeed, higher antenna elevations like these are quite consistent with the long-distance hops described by WISPA et al in the Docket.<sup>4</sup>

Of critical importance, the line of sight distance between a *46 meter* high, unlicensed long distance backhaul tower and a *30 meter* high AMT antenna is *50 km*. Thus, the required protection radius between restricted and unrestricted use of U-NII-1 backhaul transmitters is not *5.6 km* or *7 km*, but a full *50 km*.

By comparison, this distance is greater than the minimum distance within which Wireless Communication Service (“WCS”) licensees must coordinate with AMT operations at the 2360 MHz AMT/WCS band boundary. See Rule 27.73 (radio line of sight or 45 km, whichever is greater).

If WISPA were granted an extra *20 dB* of OOB relaxation below *5150 MHz*, the peak permitted EIRP for WISPA’s OOB would be *-7 dBm/MHz* across the entire *5091 - 5150 MHz* AMT/AeroMACS/GlobalStar band. When compared to the average cell tower with an 18 dBi sector antenna and an azimuthal beamwidth of *120°*, this is equivalent to an OOB attenuation factor, as defined in FCC rules and measured at the output of the U-NII-1 transmitter, of *55 + 10 log(P)* per MHz.<sup>5</sup> This is much greater than what Commission Rules allow for WCS at the band edge of 2360 MHz. Specifically, Rule 27.53 requires that the AMT band from 2360 – 2390 MHz be protected by attenuation factors of:

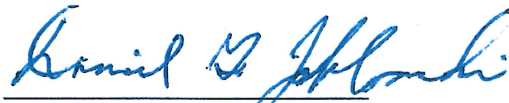
<sup>3</sup> Cell towers worldwide are stipulated to be an average height of 30 meters for purposes of ITU-R studies.

<sup>4</sup> In a previous filing by Mimosa Networks, Inc. in this proceeding, it is stated the rationale for relaxing the OOB by 20 dB is that the FCC mandated emission limit of -41 dBm/MHz “harshly limits the use of this spectrum, especially for extremely long-distance backhaul links where the 5 GHz band has traditionally been very useful.” Id., Engineering Statement at page 8. We infer that the point of relaxing the emissions limit by 20 dB when high gain directional antennas are used (thus increasing the usable distance ten-fold), is to permit these “extremely long-distance backhaul links.”

<sup>5</sup> Unlike the case for the U-NII-1 band, WCS OOB continues to fall rapidly as the distance from the band edge into the AMT band from 2360 – 2390 MHz increases. The Commerce Spectrum Management Advisory Committee (CSMAC) notes that the inclusion of 1 MHz guardbands in the 3GPP specification, in conjunction with high quality base station filters, makes this possible [CSMAC Interference and Dynamic Spectrum Access Subcommittee Final Report, November 8, 2010].

- $43 + 10 \log(P)$  from 2360 – 2362.5 MHz
- $55 + 10 \log(P)$  from 2362.5 – 2365 MHz
- $70 + 10 \log(P)$  from 2365 – 2367.5 MHz
- $72 + 10 \log(P)$  from 2367.5 – 2370 MHz
- and  $75 + 10 \log(P)$  at frequencies from 2370 – 2390 MHz.

Put another way, if the WISPA Petition were granted, it would mean that an unlicensed service would be allowed to radiate more OOB into the restricted, AMT band, than a licensed service subject to full prior coordination with AFTRCC before deployment.



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